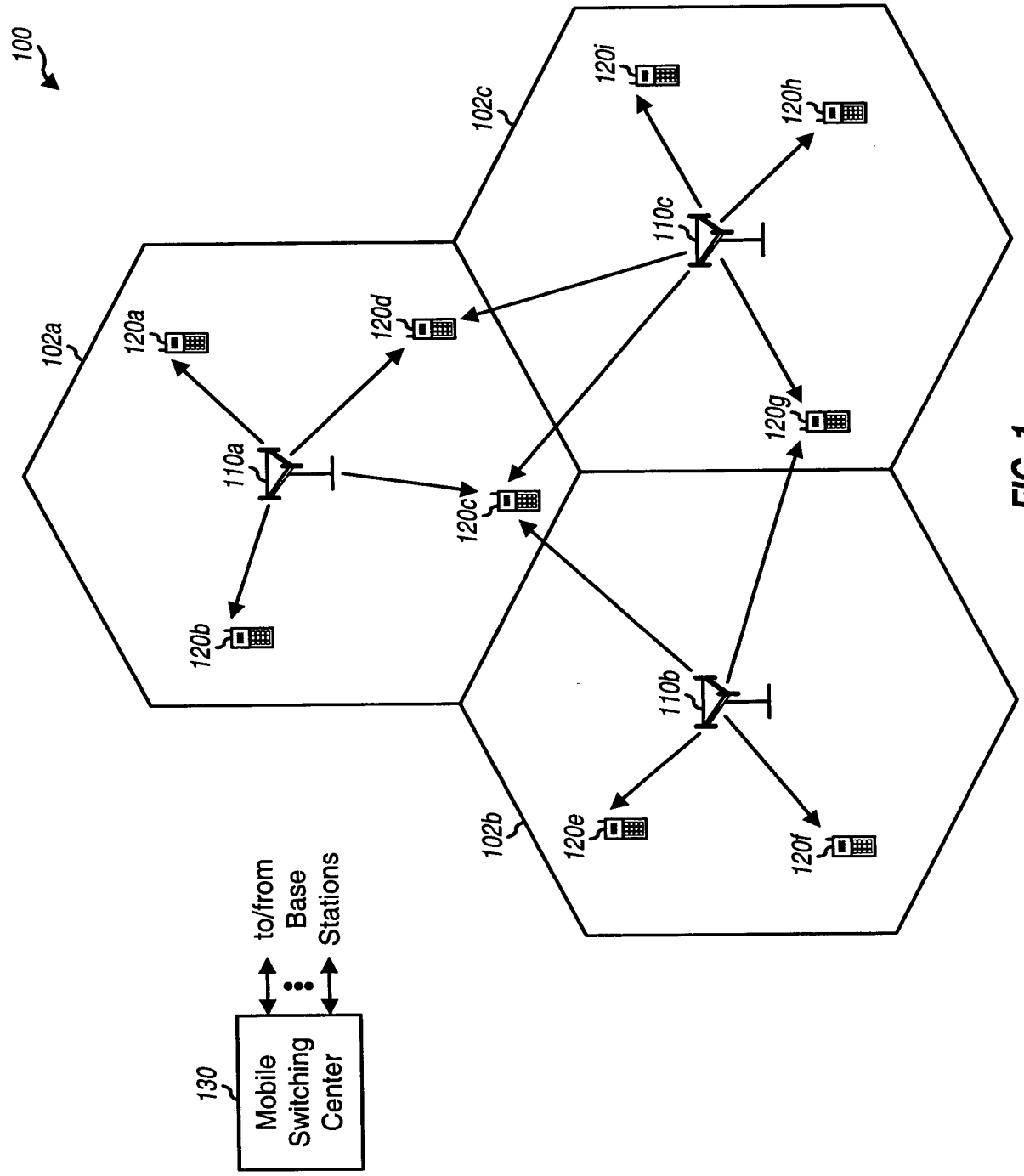
100
102a
102b
102c
110a
110b
110c
120a
120b
120c
120d
120e
120f
120g
120h
120i
130
Mobile Switching Center
to/from Base Stations

FIG. 1

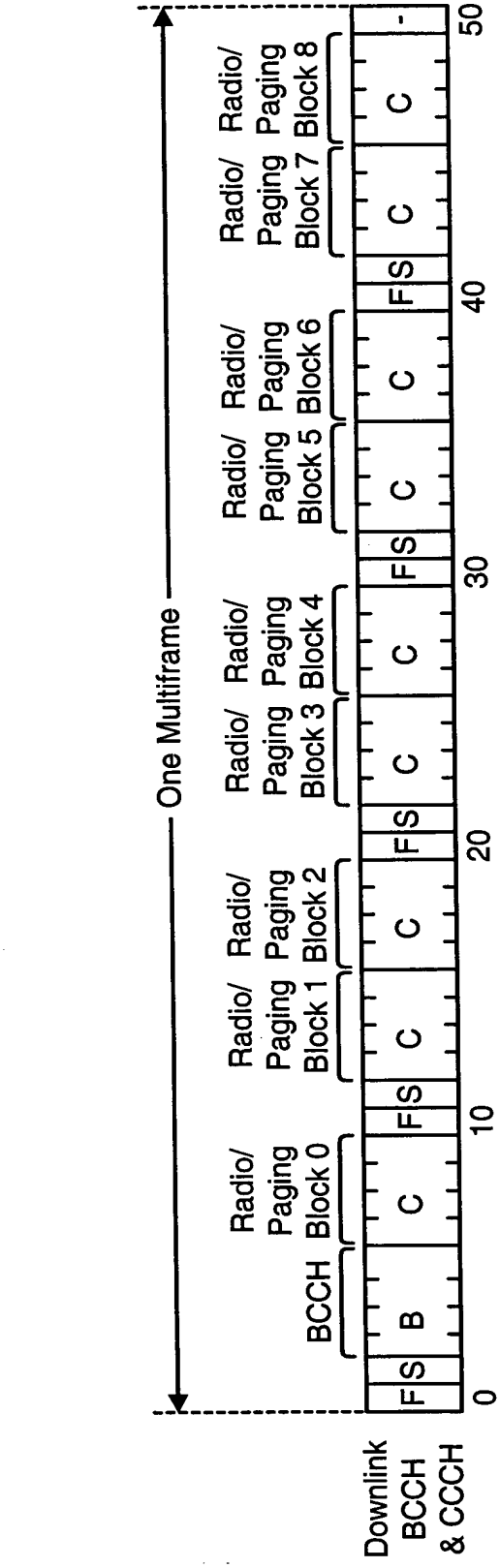
One Multiframe
Downlink BCCH & CCCH
F S B C F S C C C F S C C C F S C C -
BCCH
Radio/ Paging Block 0
Radio/ Paging Block 1
Radio/ Paging Block 2
Radio/ Paging Block 3
Radio/ Paging Block 4
Radio/ Paging Block 5
Radio/ Paging Block 6
Radio/ Paging Block 7
Radio/ Paging Block 8
0
10
20
30
40
50
TDMA Frames
F = TDMA frame for FCCH (frequency correction burst)
S = TDMA frame for SCH (synchronization burst)
B = TDMA frame for BCCH
C = TDMA frame for CCCH (e.g., PCH)

FIG. 2

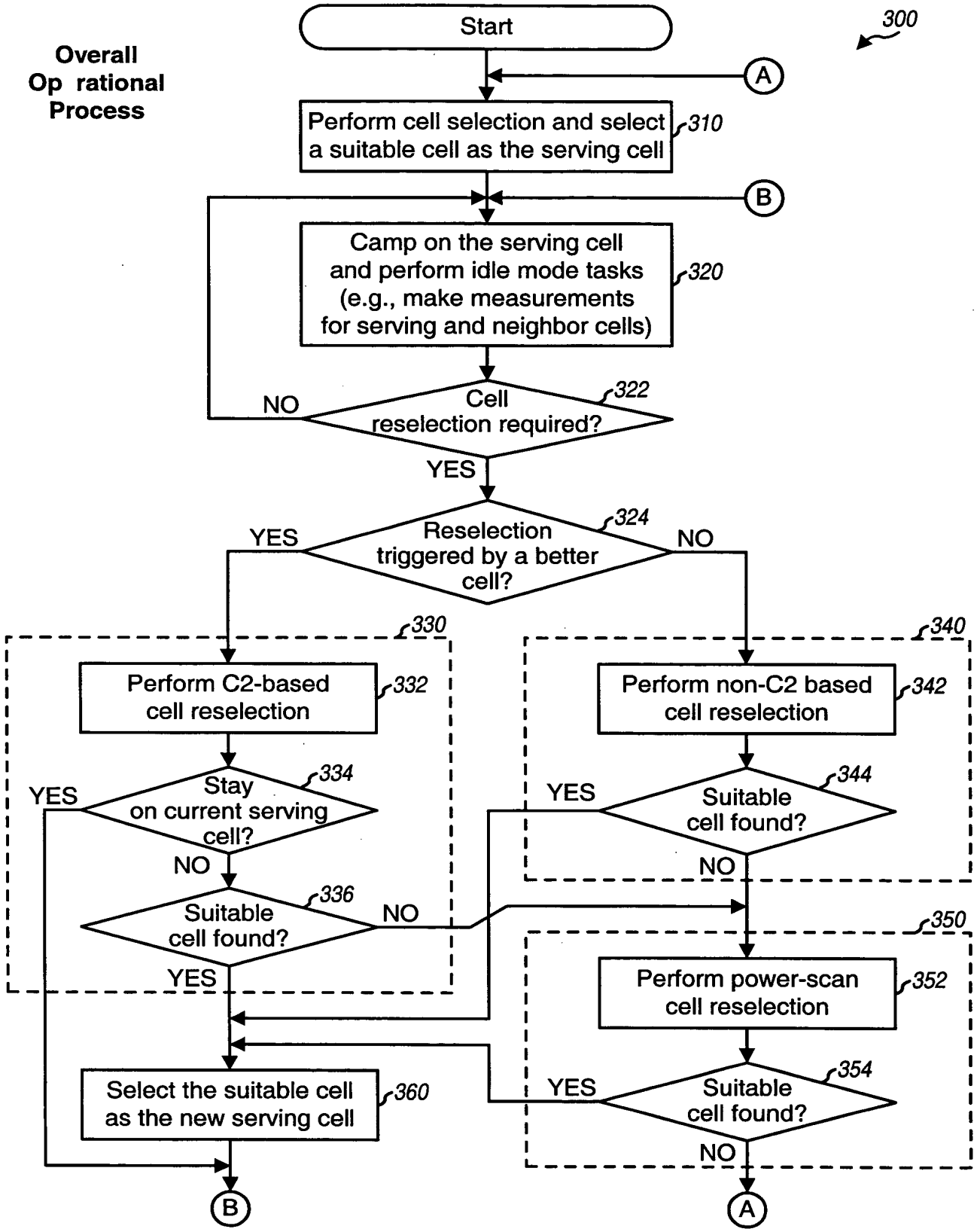
Overall Op rational Process
300
Start
A
Perform cell selection and select a suitable cell as the serving cell
310
B
Camp on the serving cell and perform idle mode tasks (e.g., make measurements for serving and neighbor cells)
320
Cell reselection required?
322
NO
YES
Reselection triggered by a better cell?
324
YES
NO
330
340
Perform C2-based cell reselection
332
Perform non-C2 based cell reselection
342
Stay on current serving cell?
334
YES
NO
Suitable cell found?
336
NO
YES
Suitable cell found?
344
YES
NO
350
Perform power-scan cell reselection
352
Select the suitable cell as the new serving cell
360
Suitable cell found?
354
YES
NO
B
A

FIG. 3

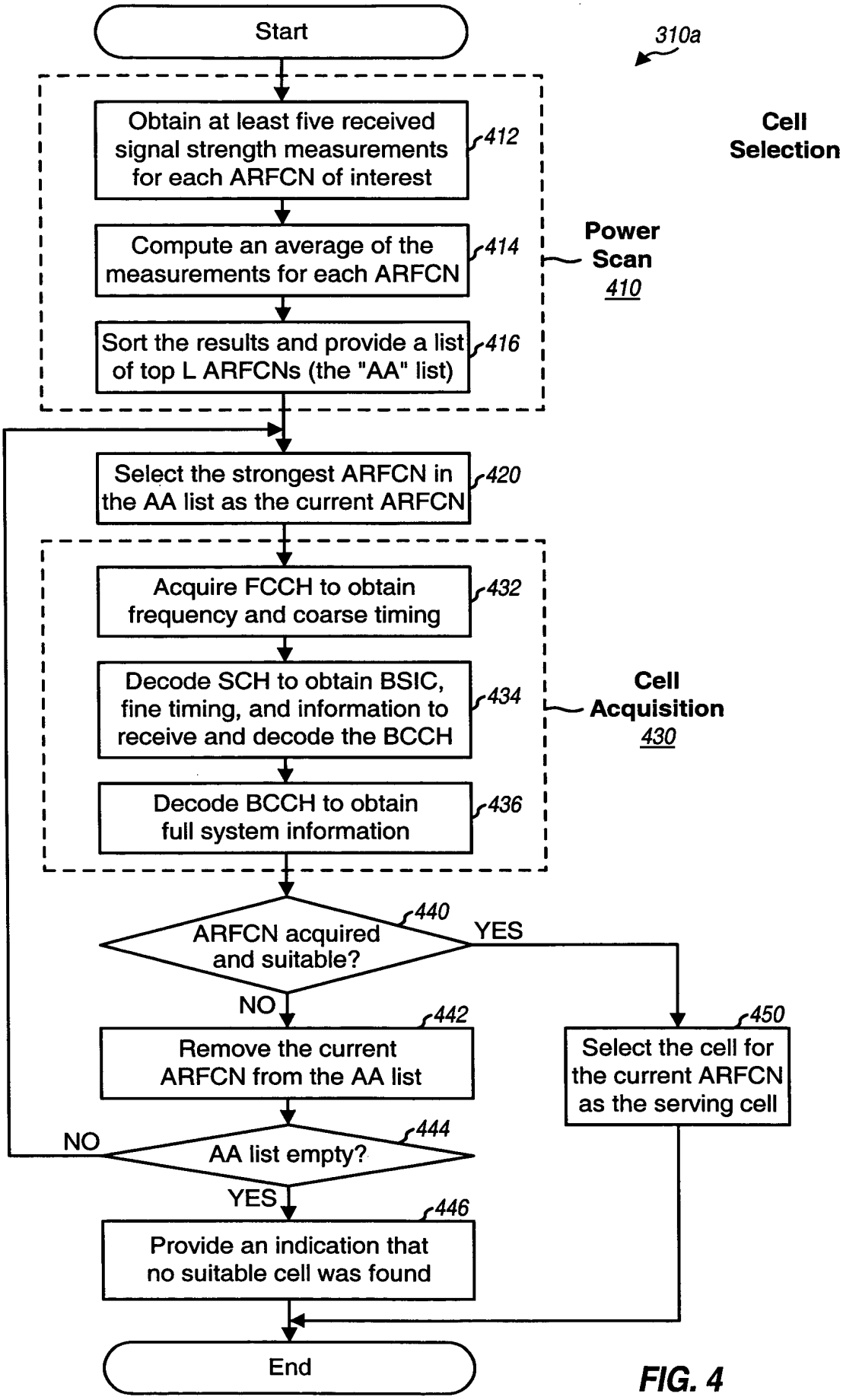
Start
310a
Cell Selection
Obtain at least five received signal strength measurements for each ARFCN of interest
412
Compute an average of the measurements for each ARFCN
414
Sort the results and provide a list of top L ARFCNs (the "AA" list)
416
Power Scan
410
Select the strongest ARFCN in the AA list as the current ARFCN
420
Acquire FCCH to obtain frequency and coarse timing
432
Decode SCH to obtain BSIC, fine timing, and information to receive and decode the BCCH
434
Decode BCCH to obtain full system information
436
Cell Acquisition
430
ARFCN acquired and suitable?
440
YES
NO
Remove the current ARFCN from the AA list
442
Select the cell for the current ARFCN as the serving cell
450
AA list empty?
444
NO
YES
Provide an indication that no suitable cell was found
446
End

FIG. 4

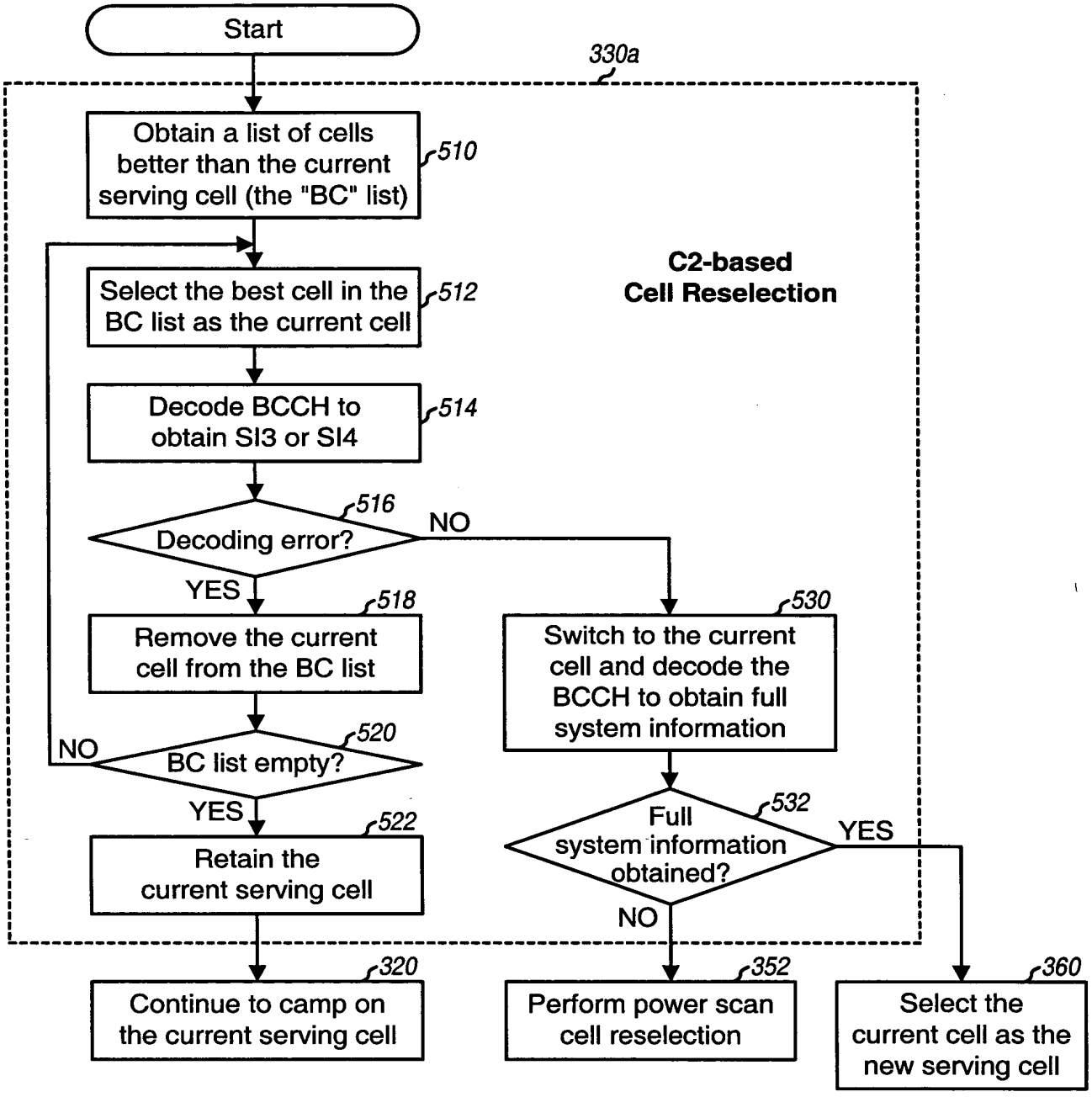
Start
330a
Obtain a list of cells better than the current serving cell (the "BC" list)
510
C2-based Cell Reselection
Select the best cell in the BC list as the current cell
512
Decode BCCH to obtain SI3 or SI4
514
516
Decoding error?
NO
YES
518
Remove the current cell from the BC list
520
NO
BC list empty?
YES
522
Retain the current serving cell
530
Switch to the current cell and decode the BCCH to obtain full system information
532
Full system information obtained?
YES
NO
320
Continue to camp on the current serving cell
352
Perform power scan cell reselection
360
Select the current cell as the new serving cell

FIG. 5

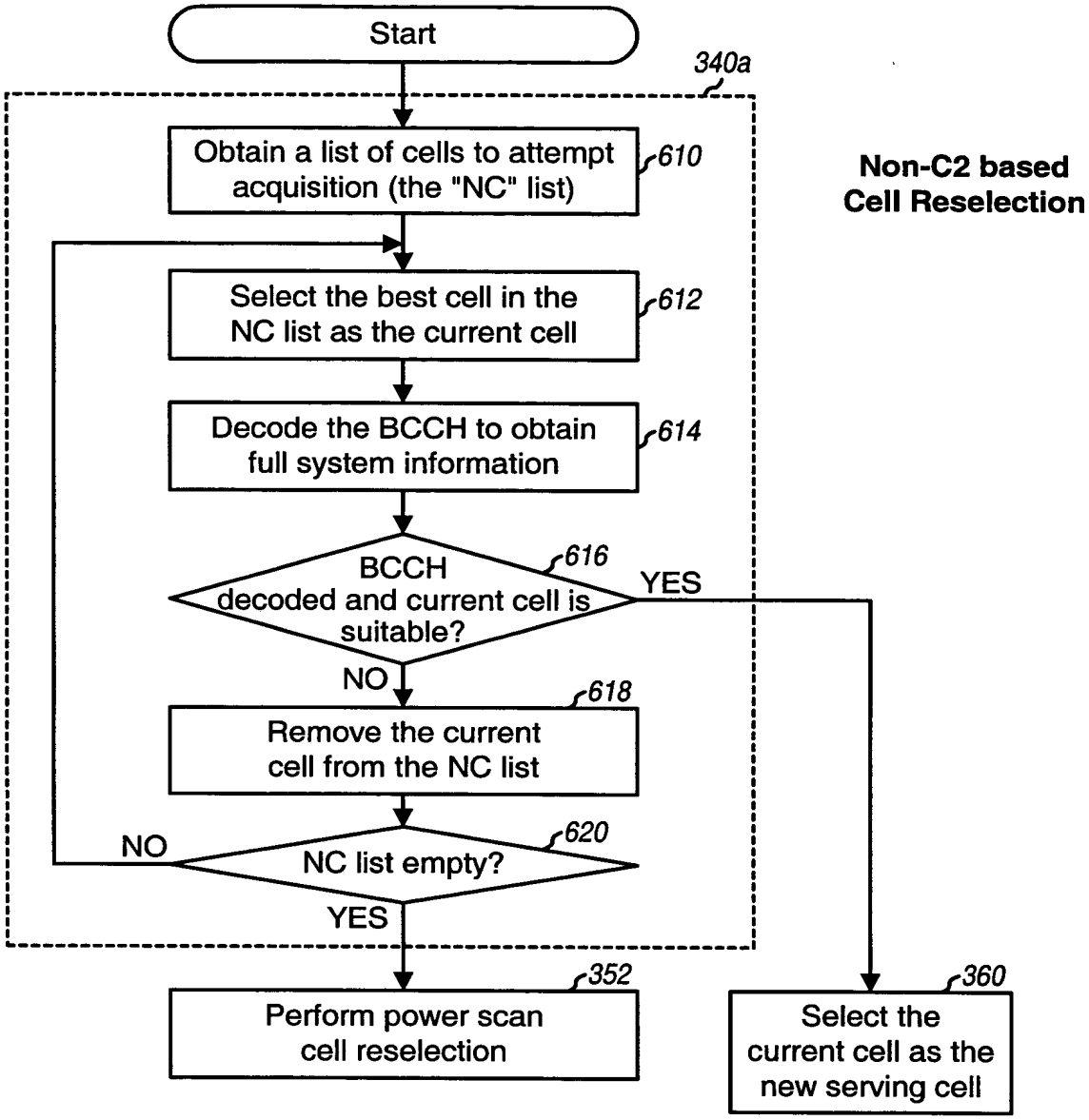
Start
340a
Obtain a list of cells to attempt acquisition (the "NC" list)
610
Non-C2 based Cell Reselection
Select the best cell in the NC list as the current cell
612
Decode the BCCH to obtain full system information
614
BCCH decoded and current cell is suitable?
616
YES
NO
Remove the current cell from the NC list
618
NO
NC list empty?
620
YES
Perform power scan cell reselection
352
Select the current cell as the new serving cell
360

FIG. 6

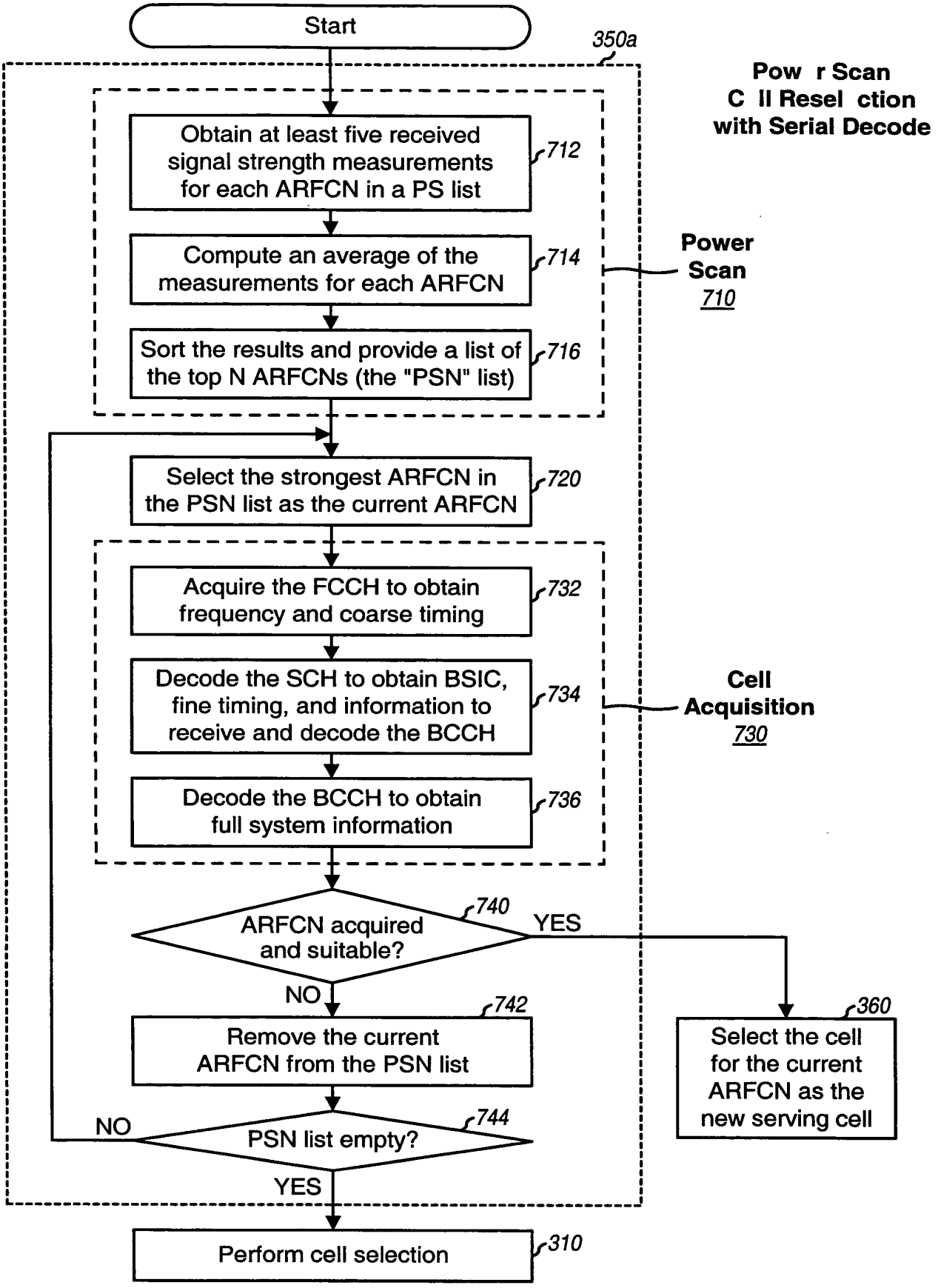
Start
350a
Power Scan Cell Reselection with Serial Decode
Obtain at least five received signal strength measurements for each ARFCN in a PS list
712
Compute an average of the measurements for each ARFCN
714
Sort the results and provide a list of the top N ARFCNs (the "PSN" list)
716
Power Scan
710
Select the strongest ARFCN in the PSN list as the current ARFCN
720
Acquire the FCCH to obtain frequency and coarse timing
732
Decode the SCH to obtain BSIC, fine timing, and information to receive and decode the BCCH
734
Decode the BCCH to obtain full system information
736
Cell Acquisition
730
ARFCN acquired and suitable?
740
YES
NO
Remove the current ARFCN from the PSN list
742
Select the cell for the current ARFCN as the new serving cell
360
NO
PSN list empty?
744
YES
Perform cell selection
310

FIG. 7

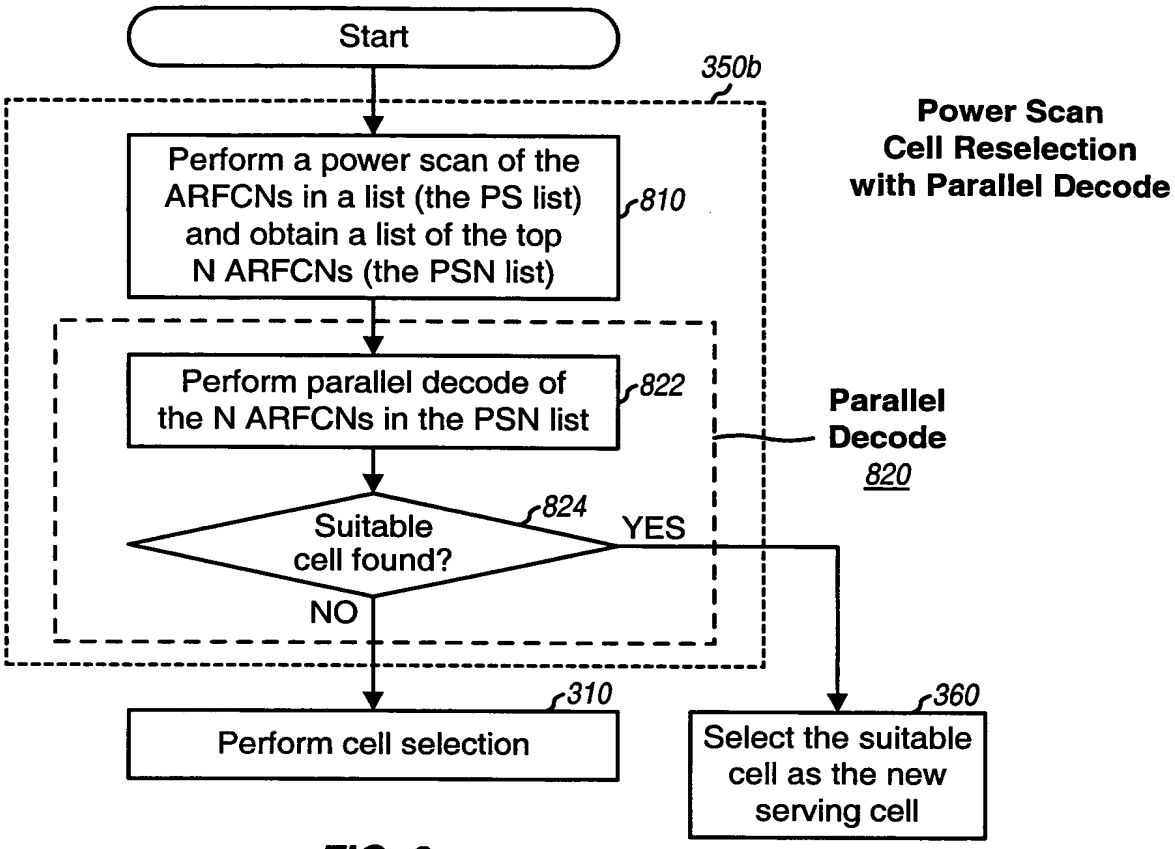
Start
350b
Power Scan
Cell Reselection
with Parallel Decode
Perform a power scan of the ARFCNs in a list (the PS list) and obtain a list of the top N ARFCNs (the PSN list)
810
Perform parallel decode of the N ARFCNs in the PSN list
822
Parallel
Decode
820
Suitable cell found?
824
YES
NO
310
Perform cell selection
360
Select the suitable cell as the new serving cell

FIG. 8

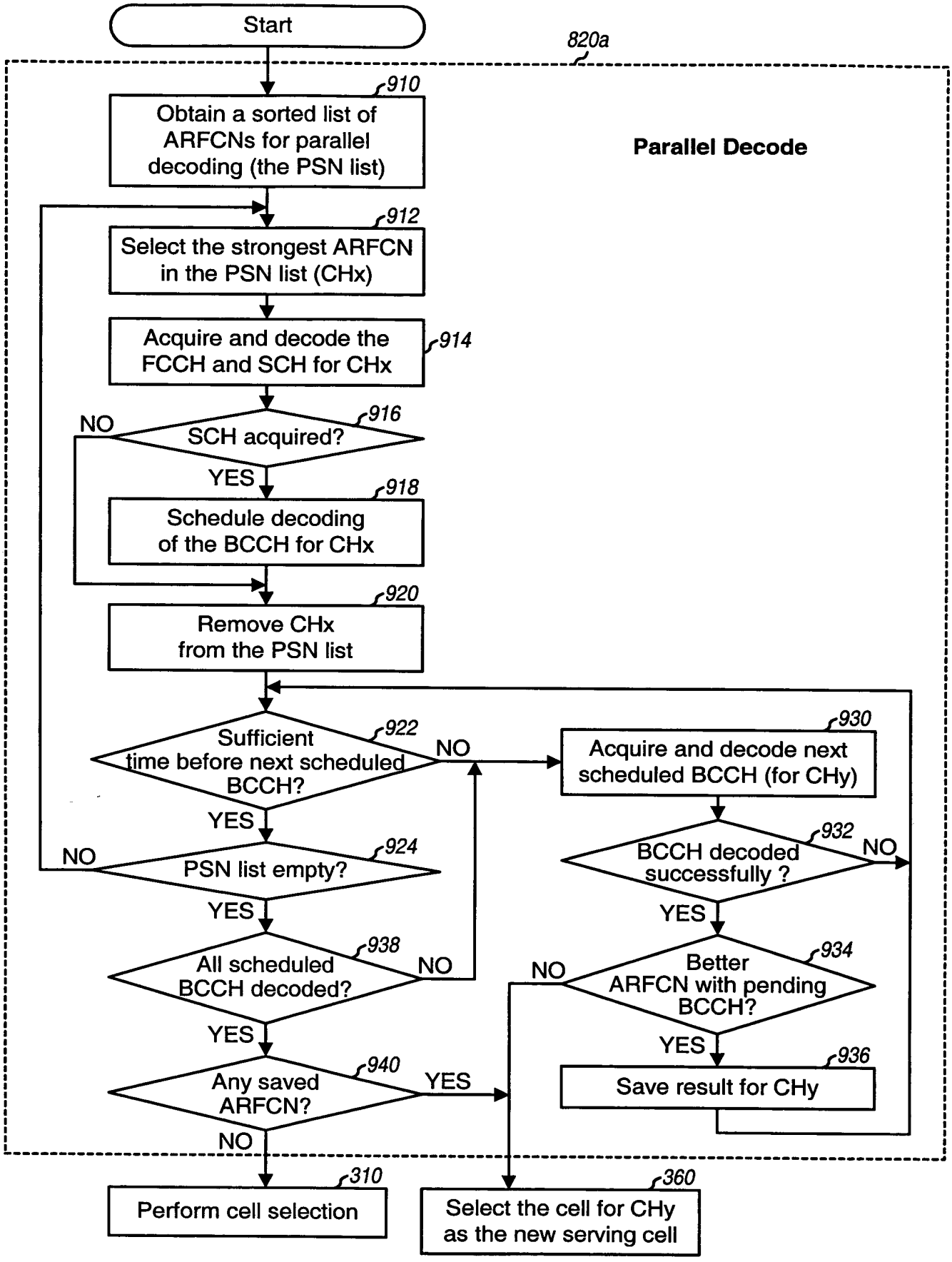
Start
820a
Parallel Decode
910
Obtain a sorted list of ARFCNs for parallel decoding (the PSN list)
912
Select the strongest ARFCN in the PSN list (CHx)
914
Acquire and decode the FCCH and SCH for CHx
916
SCH acquired?
NO
YES
918
Schedule decoding of the BCCH for CHx
920
Remove CHx from the PSN list
922
Sufficient time before next scheduled BCCH?
NO
YES
924
PSN list empty?
NO
YES
938
All scheduled BCCH decoded?
NO
YES
940
Any saved ARFCN?
YES
NO
930
Acquire and decode next scheduled BCCH (for CHy)
932
BCCH decoded successfully ?
NO
YES
934
Better ARFCN with pending BCCH?
NO
YES
936
Save result for CHy
310
Perform cell selection
360
Select the cell for CHy as the new serving cell

FIG. 9

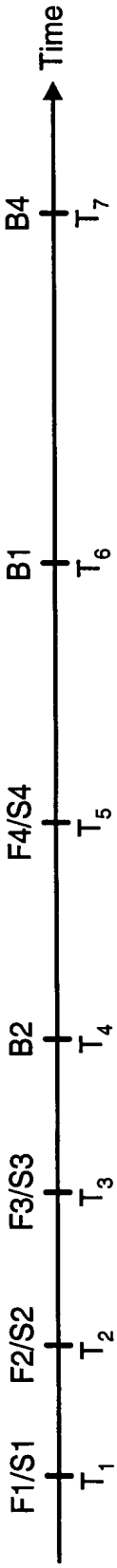
Time
F1/S1
F2/S2
F3/S3
F4/S4
B1
B2
B4
T1
T2
T3
T4
T5
T6
T7

FIG. 10

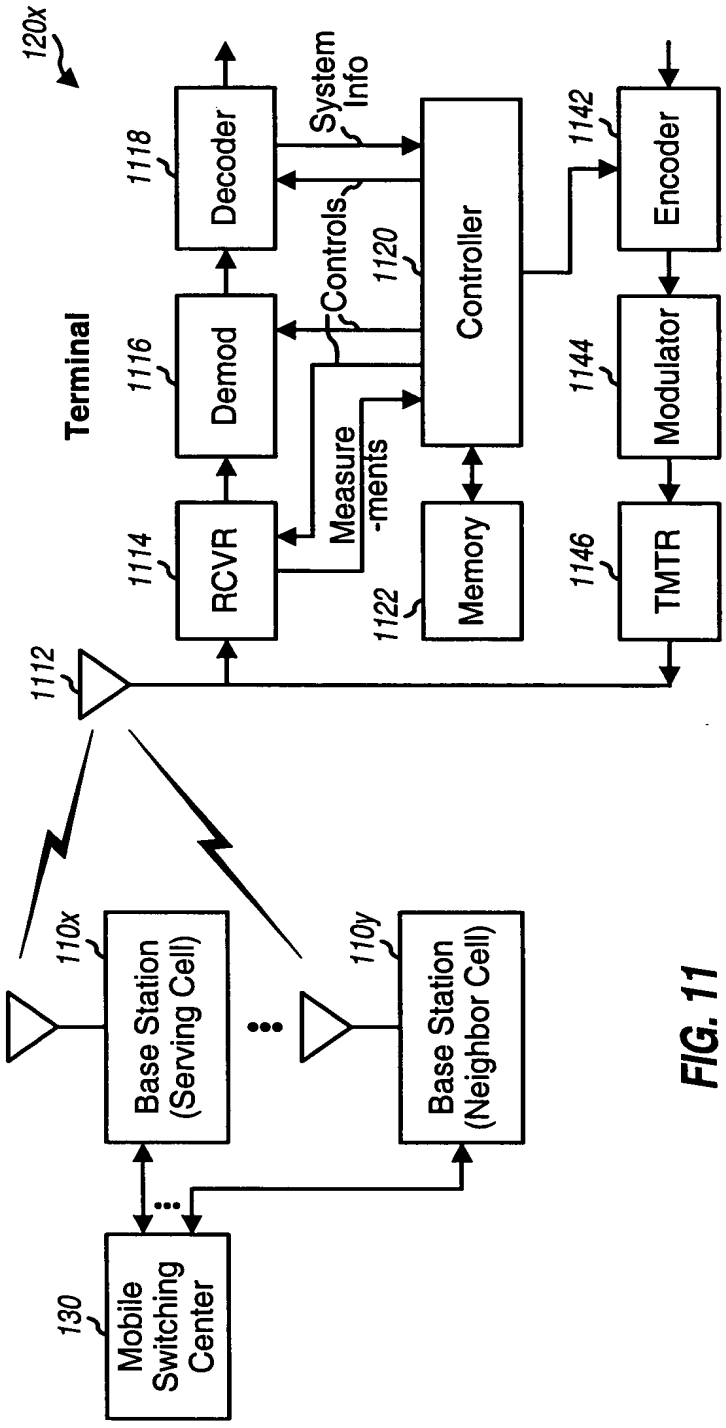
120x
Terminal
1112
1114
RCVR
1116
Demod
1118
Decoder
System Info
Controls
1120
Controller
Measure -ments
1122
Memory
1142
Encoder
1144
Modulator
1146
TMTR
110x
Base Station (Serving Cell)
110y
Base Station (Neighbor Cell)
130
Mobile Switching Center

FIG. 11